

## **Full transmission through perfect-metal subwavelength hole arrays**

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Light transmission through 2D subwavelength hole arrays in perfect metal films is shown to be complete (100%) at some resonant wavelengths even for arbitrarily narrow holes. Conversely, the reflection on a 2D planar array of non-absorbing scatterers is shown to be complete at some wavelengths regardless how weak the scatterers are. These results are proven analytically and corroborated by rigorous numerical solution of Maxwell's equations. This work supports the central role played by dynamical diffraction during light transmission through subwavelength hole arrays and it provides a systematics to analyze more complex geometries and many of the features observed in connection with transmission through hole arrays.